

$$32. y = 2\sqrt{x} - \frac{1}{\sqrt{x}}$$

$$\sqrt{x} = x^{1/2}$$

$$y = 2x^{1/2} - \frac{1}{x^{1/2}}$$

$$y = 2x^{1/2} - x^{-1/2}$$

$$y' = x^{-1/2} + \frac{1}{2}x^{-3/2}$$

$$44 \quad \frac{d}{dx} (c \cdot f(x)) = c \cdot \frac{d}{dx} f(x)$$

$$(c \cdot f'(x)) + (\underbrace{c'}_0 \cdot f(x))$$

$$c \cdot f'(x)$$

$$y', f'(x), \frac{dy}{dx}, \frac{d}{dx} f(x)$$

$$45. \frac{d}{dx} \frac{1}{f(x)}$$

$$\frac{\cancel{f(x)} \cdot 0 - 1 \cdot f'(x)}{f(x)^2}$$

$$\frac{-f'(x)}{f(x)^2}$$

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$$\frac{u u' - u v'}{v^2}$$

$$\frac{(V-nb)0 - 1(\ln RT)}{(V-nb)^2} = \frac{-nRT}{(V-nb)^2} + \frac{2an^2}{V^3}$$

$$-\frac{an^2}{V^2}$$

$$\frac{0 \cdot V^2 - 2V an^2}{V^4}$$

$$-\frac{2V an^2}{V^4} = \frac{-2an^2}{V^3}$$

$$\textcircled{20} \quad \frac{1-x}{1+x^2}$$

$$\frac{(1+x^2) \cdot -1 - (1-x) \cdot (2x)}{(1+x^2)^2}$$

$$(1-x)(1+x^2)^{-1}$$

$$(1-x) \cdot \frac{1}{(1+x^2)}$$

$$\frac{-1-x^2 - (2x-2x^2)}{(1+x^2)^2}$$

$$\frac{-1-x^2-2x+2x^2}{(1+x^2)^2}$$

$$\frac{x^2-2x-1}{(1+x^2)^2}$$

$$\text{displacement} = s$$

$$s = f(t)$$

$$\Delta s = f(t + \Delta t) - f(t)$$

$$\text{velocity} = \frac{\Delta s}{\Delta t} = \frac{f(t + \Delta t) - f(t)}{\Delta t}$$

$$\text{instantaneous velocity} \Rightarrow \lim_{\Delta t \rightarrow 0} \frac{f(t + \Delta t) - f(t)}{\Delta t} = v(t) = \frac{ds}{dt}$$

$$\text{Speed} = |v(t)| = \left| \frac{ds}{dt} \right|$$

$$\text{acceleration} \Rightarrow \frac{dv}{dt} \Rightarrow a(t) = \frac{d^2s}{dt^2}$$

$$\lim_{\Delta t \rightarrow 0} \frac{v(t + \Delta t) - v(t)}{\Delta t}$$

Sect. 3.4 # 1, 3-5, 7-9, 12-14, 15, 18, 20, 23, 25, 26, 34,
35, 36, 38

$$\frac{d}{dx} (1+x^2)^2 \neq 2(1+x^2)$$

expand first